J. Witcher 8.15.01 #18 Brief

S/N 09/191,577

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	REES ET AL.	Examiner:	Castro, A.
Serial No.:	09/191,577	Group Art Unit:	2652
Filed:	11/13/98	Docket No.:	SA998163 501.117US01

Title: MOUNTING INTERFACE FOR A SPINDLE MOTOR

CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on August 6, 2001.

Thomas J. Strouse — Name

Signature

APPELLANT'S BRIEF ON APPEAL

Box AF
Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

This Brief is presented in support of the Notice of Appeal filed May 4, 2001, from the final rejection of Claims 1-51 of the above-identified application, as set forth in the Office Action mailed January 4, 2001.

A check for $310.00 to cover the required fee for filing this Brief is enclosed. An original and two copies of the Brief are enclosed herewith.

I. REAL PARTY OF INTEREST

The Real Party of Interest is International Business Machines Corporation, a corporation of New York and the assignee of the instant application.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences for the above-referenced patent application.

III. STATUS OF CLAIMS

Claims 1-51 are pending and are the subject of this Appeal (Appendix 1, Claims). Claims 1-51 were finally rejected by the Examiner's action dated January 4, 2001. Appellant's appeal the Examiner's rejection of claims 1-51.

IV. STATUS OF AMENDMENTS

An initial Office Action was mailed on July 6, 2001 (Appendix 2A). An Amendment in response to the initial Office Action was mailed on October 6, 2000 (Appendix 2B). A final Office Action was mailed on January 4, 2001 (Appendix 2C). An Amendment in response to the final Office Action was filed on March 28, 2001, under 37 C.F.R. § 1.116 (Appendix 2D). An Advisory Action mailed April 4, 2001 indicated that the response to the Office Action was entered into the record (Appendix 2E). An Interview Summary mailed April 19, 2001 indicates that the Examiner maintains that Kirkwood teaches the invention as claimed, therefore the position of record is maintained (Appendix 2F).

V. SUMMARY OF THE INVENTION

The Appellant's invention relates to a spindle motors for disk drives, and more particularly to a mounting interface for a spindle motor. The mounting interface for a spindle motor allows the optimization of spindle dynamics. The mounting interface provides a steadfast relationship between a motor and a baseplate, wherein the mounting interface includes at least three surface points forming a single plane acting as a common boundary between the motor and the baseplate. The three surface points may be pads, and the pads may be coupled to the baseplate or to the mount flange. The three surface points provide reduced contact area between the mount flange and the baseplate, and the reduced contact area lowers the rigidity of the mount flange and the resonant frequencies. The surface area of the pads and the material of the pads are chosen to reduce acoustical noise. In addition, a damping ring may be provided

for dissipating distortion energy between the motor, baseplate and/or mount flange.

VI. ISSUES PRESENTED FOR REVIEW

Issue 1:

Whether the invention of claims 1-4, 6-8, 31, 33-34, 36-38, 46 is anticipated by Kirkwood under 35 U.S.C. 102(e).

In the Office Action of January 4, 2001, the Office Action indicates Kirkwood discloses a mounting interface for providing a steadfast relationship between a motor 22 and a baseplate 50, the mounting interface comprising at least three surface points 58 forming a single plane acting as a common boundary between the motor and the baseplate, the positions of the at least three surface points being selected to affect a vibrational characteristic of the motor.

Issue 2:

Whether the invention of claims 5, 16-20, 21-23, 32 and 35 is unpatentable over Kirkwood under 35 U.S.C. 103(a).

According to the Office Action, with respect to claims 16-19 and 21-23, Kirkwood discloses a mounting interface described by Appellant. However, according to the Office Action, Kirkwood does not disclose the data storage system comprising a storage medium, an actuator and a spindle motor for rotating the storage medium. Nevertheless, according to the Office Action, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the mounting interface of Kirkwood into a data storage system comprising a storage medium, and an actuator and a spindle motor for rotating the storage medium. The rationale, according to the Office Action, is that one of ordinary skill in the art would have been motivated to incorporate the mounting interface of Kirkwood into a data storage system comprising a storage medium, an actuator and a spindle motor for rotating the storage medium as it would reduce the vibration of the spindle motor as well as the acoustical noise.

According to the Office Action, with respect to claims 5, 20 and 35,

Kirkwood does not disclose that the at least three surface points provides reduced contact area and lowering the resonant frequencies. However, according to the Office Action, Official Notice was taken that it was notoriously old and well known to lower the resonant frequencies by reducing the contact areas between the motor and the baseplate. Therefore, according to the Office Action, it would have been obvious to one of ordinary skill in the art at the time the invention was made to lower the resonant frequencies by reducing the contact areas between the motor and the baseplate. The motivation, according to the Office Action, is that by lowering the resonant frequencies, possible damage to the motor and a disk attached to it would be prevented.

According to the Office Action, with respect to claim 32, Kirkwood does not disclose forming the mounting interface on the baseplate. Nevertheless, according to the Office Action, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the mounting interface of Kirkwood on the baseplate. The rationale, according to the Office Action, is that one of ordinary skill in the art would have been motivated to provide the mounting interface of Kirkwood on the baseplate as it would simplify the mounting of the motor.

Issue 3:

Whether the invention of claims 9-15, 24-30, 39-45 and 47-51 is unpatentable over Kirkwood in view of Merriman, Jr. under 35 U.S.C. 103(a).

According to the Office Action, with respect to claims 9-15, 24-30, 39-45 and 47-51, Kirkwood discloses a mounting interface described by Appellant. However, according to the Office Action, Kirkwood does not discloses a damping ring between the at least three surface points. Nevertheless, according to the Office Action, Merriman, Jr. discloses a motor vibration isolator with a mounting interface 10 comprising a damping ring 20, 22, with a portion 22-3 disposed perpendicular to the single plane on an outer surface of at least three points of the mounting interface and a seal 20. Thus, according to the Office Action, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the mounting interface of Kirkwood with the

damping ring and seal as taught by Merriman, Jr. The rationale, according to the Office Action, is that one of ordinary skill in the art would have been motivated to provide the mounting interface of Kirkwood with the damping ring and seal as taught by Merriman, Jr. as it would isolate the motor from the baseplate and provide a circular locating step.

VII. GROUPING OF CLAIMS

For consideration on this appeal, Appellant submits that the claims can be grouped as follows:

Group 1: Claims 1-4, 6 and 8;

Group 2: Claim 5;

Group 3: Claim 7;

Group 4: Claims 9-11, 13, 14, 46-47,49 and 50;

Group 5: Claims 12,15, 48 and 51;

Group 6: Claims 16-21 and 23;

Group 7: Claim 22;

Group 8: Claims 24-26, 28 and 29;

Group 9: Claims 27 and 30;

Group 10: Claims 31, 33-36, 38 and 39;

Group 11: Claim 32;

Group 12: Claim 37;

Group 13: Claims 40-44; and

Group 14: Claim 45.

VIII. ARGUMENT

A. Statement on Grouping of Claims

Appellant has grouped rejected claims 1-51 into Groups 1-14, as specified above. The claims of one Group do not stand or fall with the claims of another Group.

The Group 1 claims are directed to a mounting interface for providing a steadfast relationship between a motor and a baseplate, wherein the mounting interface includes at least three surface points forming a single plane acting as a common boundary between the motor and the baseplate. Further, the positions of the at least three surface points being selected to affect a vibrational characteristics of the motor.

The Group 2 claim includes the features of claim 1 of Group 1, and further defines a distinguishing feature of providing a reduced contact area between the mount flange and the baseplate, the reduced contact area lowering rigidity of the mount flange and lowering resonant frequencies that is neither taught nor suggested in the Prior Art.

The Group 3 claim includes the features of claim 1 of Group 1, and further defines a distinguishing feature that the at least three surface points are formed using a predetermined material, the predetermined material being chosen to reduce acoustical noise that is neither taught or suggested in the Prior Art.

The Group 4 claims include the features of claim 1 of Group 1 or of claim 46, and further define a distinguishing feature of providing a damping ring disposed on an inner side and between the at least three surface points for dissipating distortion energy that is neither taught nor suggested in the Prior Art.

The Group 5 claims include the features of claim 1 of Group 1 or of claim 46, and further define a distinguishing feature of a seal disposed on the portion on the outer surface of the at least three surface points of the mounting interface, the seal forming a barrier in a gap between the mount flange and the baseplate that is neither taught nor suggested in the Prior Art.

The Group 6 claims are directed to a data storage system including, a storage medium, an actuator, an actuator motor, a spindle motor, and a mounting interface that is neither taught nor suggested in the Prior Art.

The Group 7 claim includes the features of claim 16 of Group 6, and further defines a distinguishing feature that the at least three surface points are formed using a predetermined material, the predetermined material being chosen to reduce acoustical noise that is neither taught nor suggested in the Prior Art.

The Group 8 claims include the features of claim 16 of Group 6, and further define a distinguishing feature of providing a damping ring disposed on an inner side and between the at least three surface points for dissipating distortion energy that is neither taught nor suggested in the Prior Art.

The Group 9 claims include the features of claim 16 of Group 6, and further define a distinguishing feature of a seal disposed on the portion on the outer surface of the at least three surface points of the mounting interface, the seal forming a barrier in a gap between the mount flange and the baseplate that is neither taught nor suggested in the Prior Art.

The Group 10 claims are directed to a method for reducing acoustic dynamics of a spindle motor, including forming a mounting interface between a spindle motor and a baseplate, wherein the mounting interface includes at least three surface points forming a single plane acting as a common boundary between the spindle motor and the baseplate. Further, the positions of the at least three surface points being selected to affect a vibrational characteristic of the motor that is neither taught nor suggested in the Prior Art.

The Group 11 claim includes the features of claim 31 of Group 10, and further defines a distinguishing feature of forming a mounting interface on the baseplate that is neither taught nor suggested in the Prior Art.

The Group 12 claim includes the features of claim 31 of Group 10, and further defines a distinguishing feature that the at least three surface points are formed using a predetermined material, the predetermined material being chosen to reduce acoustical noise that is neither taught nor suggested in the Prior Art.

The Group 13 claims include the features of claim 31 of Group 10, and further define a distinguishing feature of providing a damping ring disposed on an inner side and between the at least three surface points for dissipating distortion energy that is neither taught nor suggested in the Prior Art.

The Group 14 claim includes the features of claim 31 of Group 10, and further defines a distinguishing feature of a seal disposed on the portion on the outer surface of the at least three surface points of the mounting interface, the seal forming a barrier in a gap between the mount flange and the baseplate that is neither taught nor suggested in the Prior Art.

In view of the differences in scope and focus with respect to the claims of Groups 1-14, Appellant respectfully asserts that these Groups of claims should be reviewed by the Board as separately patentable inventions for purposes of this Appeal.

B. Issue 1

APPELLANT'S INVENTION, AS RECITED IN CLAIMS 1-4, 6-8, 31, 33-34, 36-38, 46, IS NOT ANTICIPATED UNDER 35 U.S.C. §102(e) BY KIRKWOOD.

1. KIRKWOOD DOES NOT DISCLOSE, EXPRESSLY OR INHERENTLY, A MOUNTING INTERFACE WHEREIN THE POSITIONS OF THE AT LEAST THREE SURFACE POINTS ARE SELECTED TO AFFECT A VIBRATIONAL CHARACTERISTIC OF THE MOTOR AS RECITED IN CLAIMS 1-4, 6 AND 8.

Appellant's invention is directed to mounting an interface between a disk drive spindle motor and the drive baseplate, which enables optimization of spindle dynamics. This is achieved by providing a means to shift resonant frequencies to a desired location and by providing a more repeatable boundary condition for the spindle motor.

According to Appellant's invention, as recited in claims 1-4, 6 and 8 of Group 1, the mounting interface provided between a motor and a baseplate includes at least three surface points that act as a boundary between the motor and the baseplate. The positioning of the at least three surfaces is selected to affect a vibrational characteristic of the motor. For example, the surface points are positioned to provide reduced contact area between a mount flange of the motor and the baseplate, thus, the reduced contact area lowers the rigidity of the mount

flange and lowers resonant frequencies. Additionally, the surface area of the surface points and material used to form the surface points are selected to reduce acoustical noise.

In contrast to Appellant's invention, Kirkwood merely discloses that a motor isolating assembly 53 has an upper motor cover 54. Further, the upper motor cover has a "plurality of protrusions . . . [that] are located proximate fastener 32" and also that the "protrusions are distributed over the exterior drive shaft side of [the] motor cover." (See column 4, lines 3-4 and lines 51-57).

Kirkwood does not teach, expressly or inherently, that the position of the protrusions (surface points) is selected for the purpose of affecting the vibrational characteristics of the motor. Therefore, Appellant respectfully submits that claims 1-4, 6 and 8 are patentable over Kirkwood.

2. KIRKWOOD DOES NOT DISCLOSE, EXPRESSLY OR INHERENTLY, A METHOD FOR REDUCING ACOUSTIC DYNAMICS OF A SPINDLE MOTOR, COMPRISING FORMING A MOUNTING INTERFACE BETWEEN A SPINDLE MOTOR AND A BASEPLATE, THE MOUNTING INTERFACE COMPRISING AT LEAST THREE SURFACE POINTS FORMING A SINGLE PLANE ACTING AS A COMMON BOUNDARY BETWEEN THE SPINDLE MOTOR AND THE BASEPLATE, POSITIONS OF THE AT LEAST THREE SURFACE POINTS BEING SELECTED TO AFFECT A VIBRATIONAL CHARACTERISTIC OF THE MOTOR AS RECITED IN CLAIMS 31, 33-36, 38 AND 39.

According to Appellant's invention, as recited in claims 31, 33-36, 38 and 39 of Group 10, the invention includes a method of reducing acoustic dynamics of a spindle motor, including forming a mounting interface between a spindle motor and a baseplate, the mounting interface including at least three surface points forming a single plane acting as a common boundary between the spindle motor and the baseplate. Further, in Appellant's invention, the positions of the at least three surface points are selected to affect a vibrational characteristic of the motor. For example, the surface points are formed to provide reduced contact area

between a mount flange of the motor and the baseplate, thus, the reduced contact area lowers the rigidity of the mount flange and lowers resonant frequencies. Additionally, the surface area of the surface points and material used to form the surface points are selected to reduce acoustical noise.

Kirkwood, as discussed in the previous section, does not suggest forming a mounting interface, wherein the position of the protrusions (surface points) is selected to affect the vibrational characteristics of the motor. Therefore, Appellant respectfully submits that claims 31, 33-36, 38 and 39 are patentable over Kirkwood.

3. KIRKWOOD DOES NOT DISCLOSE, EXPRESSLY OR INHERENTLY, THAT AT LEAST THREE SURFACE POINTS ARE FORMED USING A PREDETERMINED MATERIAL, THE PREDETERMINED MATERIAL BEING CHOSEN TO REDUCE ACOUSTICAL NOISE AS RECITED IN CLAIM 37.

According to Appellant's invention, as recited in claim 37 of Group 12, the at least three surface points are formed using a predetermined material, the predetermined material being chosen to reduce acoustical noise. Thus, the material selected for the surface points is one parameter that allows optimization of a desired frequency shift.

Kirkwood does not disclose that a predetermined material is chosen for the protrusions to reduce acoustical noise. Rather, Kirkwood merely discloses that the isolator, upper motor cover and lower motor cover are made of a flexible material, such as rubber or a like synthetic material. However, Kirkwood does not disclose that the protrusions that are "distributed over the exterior drive shaft side of the upper motor cover" are chosen to reduce acoustical noise. (See column 4, lines 3-4 and lines 51-57).

Thus, Kirkwood does not disclose that the surface points are formed using a predetermined material, wherein the predetermined material is chosen to

reduce acoustical noise. Therefore, Appellant respectfully submits that claim 37 is patentable over Kirkwood.

4. KIRKWOOD DOES NOT DISCLOSE, EXPRESSLY OR INHERENTLY, A MOUNTING INTERFACE COMPRISING A DAMPING RING DISPOSED ON THE INNER SIDE AND BETWEEN AT LEAST THREE SURFACE POINTS, THE DAMPING RING DISSIPATING DISTORTION ENERTY, POSITIONS OF THE AT LEAST THREE SURFACE POINTS BEING SELECTED SO AS TO AFFECT A VIBRATIONAL CHARACTERISTIC OF THE MOTOR AS RECITED IN CLAIMS 46.

As admitted by the Examiner in paragraph 5 on page 4 of the final Office Action, Kirkwood does not disclose a damping ring between the at least three surface points. This feature is neither expressly disclosed of inherently taught by Kirkwood.

Therefore, claim 46 is patentable over Kirkwood.

Issue 2:

1. CLAIMS 5, 16-20, 21-23, 32 AND 35 ARE PATENTABLE OVER KIRKWOOD.

To establish a *prima facie* case of obviousness, three basic criteria must be met:

1) There must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings;
2) there must be a reasonable expectation of success; and
3) the prior art reference (or references when combined) must teach or suggest all the claim limitations.
(M.P.E.P. §2142).

Appellant respectfully submits that Kirkwood fails to suggest all the claim limitations with respect to at least claims 5, 16-20, 21-23, 32 and 35. Appellant respectfully submits that the Examiner bears the burden of establishing a prima facie case of obviousness based upon the prior art. The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. In re Gordon, 733 F.2d at 902, 221 USPQ at 1127.

In particular, the Examiner concludes, without reliance on a supporting reference, that to lower the resonant frequencies by reducing the contact areas between motor and the baseplate is "well known" in the arts. Appellant respectfully asserts that a mounting interface including at least three surface points forming a single plane acting as a common boundary between the motor and the baseplate, wherein positions of the at least three surface points being selected to affect a vibrational characteristic of the motor do not constitute facts outside of the record which are capable of instant and unquestionable demonstration as being "well-known" in the art. The references relied on by the Examiner, for example, fail to disclose this purportedly "well known" fact. Appellant contends that reasonable doubt exists regarding the circumstances justifying the Examiner's exercise of official notice, and requests that the Examiner provide evidence that demonstrates the appropriateness of the officially noticed facts pursuant to MPEP § 2144.03. Appellant reserves the opportunity to respond to the Examiner's comments concerning any such judicially noticed facts.

In determining the differences between the prior art and the claims, the question under 35 U.S.C. § 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. Taking official notice of the above-discussed "facts" disregards the requirement of analyzing Appellant's claimed subject matter "as a whole." Appellant respectfully reiterates the legal tenet that facts so noticed should not comprise the principle evidence upon which a rejection is based. MPEP § 2144.03.

Because several features of Appellant's invention are neither taught nor suggested by the asserted combination, and because supplying the missing features by exercise of official notice is inappropriate, Appellant's claims 5, 16-20, 21-23, 32 and 35 are believed to be patentable over Kirkwood and Merriman.

According to Appellant's invention, as recited in claim 5 of Group 2, the at least three surface points provide reduced contact area between the mount flange and the baseplate, the reduced contact area lowering rigidity of the mount flange and lowering resonant frequencies. For example, the selection of the position of the surface points changes the spindle motor boundary conditions to lower the dynamic rigidity of the mount flange. This results in lower resonant frequencies for troublesome vibration modes. Thus, by shifting the resonant frequency in this manner, interaction between resonant frequency and excitation frequency of the motor can be avoided to improve acoustics and track following performance. The surface points (e.g., mount pads) provide a frequency reduction of approximately 80 Hz, for example. However, those skilled in the art will recognize that the invention is not meant to be limited to a particular embodiment, but that the size of the mount pads and the material selected for the mount pads are parameters that allow optimization of the desired frequency shift.

In contrast to Appellant's invention, Kirkwood merely discloses an upper motor cover, wherein the upper motor cover has a plurality of protrusions. Nowhere does Kirkwood suggest that the position of the surface points are selected to affect the vibrational characteristics of the motor, such as by lowering rigidity of the mount flange and lowering resonant frequencies. Therefore, Appellant respectfully submits that claim 5 is patentable over Kirkwood.

As admitted by the Examiner in paragraph 4 on page 3 of the final Office Action, Kirkwood does not disclose the data storage system comprising a storage medium, an actuator, a spindle motor for rotating the storage medium and a mounting interface of the type presented in the claims. However, according to the Office Action, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the mounting interface of Kirkwood into a data storage system comprising a storage medium and an actuator and a spindle motor for rotating the storage medium.

As previously stated, the mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. In re Gordon, 733 F.2d at 902, 221 USPQ at 1127.

In view of the above remarks, claims 16-21 and 23 of Group 6 are patentable over Kirkwood.

According to Appellant's invention, as recited in claim 22 of Group 7, in the data storage device at least three surface points are formed using a predetermined material, the predetermined material being chosen to reduce acoustical noise. Thus, the material selected for the mount pads is one parameter that allows optimization of a desired frequency shift.

Kirkwood, as discussed previously, does not disclose that a predetermined material is chosen for the protrusions to reduce acoustical noise, and merely discloses that the isolator, upper motor cover and lower motor cover are made of a flexible material, such as rubber or a like synthetic material. Thus, Kirkwood does not suggest that the surface points are formed using a predetermined material, wherein the predetermined material is chosen to reduce acoustical noise. Therefore, Appellant respectfully submits that claim 22 is patentable over Kirkwood.

According to Appellant's invention, as recited in claim 32 of Group 11, the forming of a mounting interface between a spindle motor and a baseplate further comprises forming the mounting interface on the baseplate.

Appellant reiterates that Kirkwood discloses "protrusions are distributed over the exterior drive shaft side of [a] motor cover" to produce a reduction in surface area and thus provide a reduction in the transmission of motor vibration. (See column 4, lines 3-4 and lines 51-57). Thus, in Kirkwood, the protrusions are disposed on the motor cover that is located between the motor and the frame. Kirkwood does not even consider forming the mounting interface on the baseplate (frame).

Therefore, Appellant respectfully submits that claim 32 is patentable over Kirkwood.

Claim 35 of Group 10 is patentable over Kirkwood for reasons similar to those articulated in paragraph 2 of Issue 2 with respect to claim 5 of Group 2. Appellant respectfully submits that Kirkwood does not disclose, teach or suggest all of the claimed limitations of Appellant's claim 35. Moreover, Kirkwood fails to provide the requisite suggestions of motivation that would lead one skilled in the art to arrive at Appellant's invention of claim 35.

Therefore, Appellant respectfully submits that claim 35 is patentable over Kirkwood.

Issue 3:

APPELLANT'S INVENTION, AS RECITED IN CLAIMS 9-15, 24-30, 39-45 AND 47-51, IS PATENTABLE OVER KIRKWOOD AND MERRIMAN, JR.

1. THE REFERENCES DO NOT PROVIDE A BASIS FOR THE COMBINATION OF REFERENCES.

Appellant respectfully submits that the references are not properly combinable. Appellant contends that a *prima facie* case of obviousness has not been established, as described more fully below. To establish a *prima facie* case of obviousness, there must be some actual *motivation* to combine the Kirkwood and the Merriman reference found in the references themselves, the knowledge of one of ordinary skill in the art or from the nature of the problem to be solved that would suggest the combination. Without a suggestion of the desirability of "the combination," a combination of such references is made in hindsight, and the "range of sources available, however, does not diminish the requirement for actual evidence." *In re Dembiczak*, 50 USPQ2d 1614 (Fed. Cir. 1999). It is a requirement that actual evidence of a suggestion, teaching or motivation to combine prior art references be shown, and that this evidence be "clear and particular." *Id.* Broad conclusory statements regarding the teaching of multiple references, standing alone, are not evidence. *Id.*

It is respectfully submitted that Kirkwood fails to provide any suggestion to implement or otherwise be combined with a device that provides a circular step

insert which mounts on an isolation member located between a stepping motor and a frame, and Merriman fails to provide any suggestion to implement or otherwise be combined with a device that provides a reduction in motor vibration by using protrusions to reduce the surface area between a motor and a mounting flange. Appellant thus respectfully contends that a *prima facie* case of obviousness has not been established as no "clear and particular" evidence of motivation to combine can be identified.

More particularly, the Examiner noted that Kirkwood "does not disclose a damping ring between the at least three surface points." The Appellant agrees with the Examiner that Kirkwood does not teach a damping ring, and Kirkwood cannot therefore reasonably be said to provide a teaching or suggestion to any damping ring between the at least three surfaces, much less, an insert (circular damping ring) that mounts between a step motor and a mounting flange without reducing surface area contact between surfaces.

Further, in discussing a combination of Kirkwood and Merriman, the Examiner states that it would have been obvious to provide the mounting interface of Kirkwood with the damping ring and seal taught by Merriman because "it isolate[s] the motor from the baseplate and provides a circular locating step." In other words, the need to "isolate the motor from the baseplate and provide a circular locating step" is what Merriman teaches is the benefit of the Merriman invention itself (according to the Examiner), and not a motivation to combine with Kirkwood. The examiner must show some objective teaching leading to the combination. *In re Fine*, 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988). It is respectfully submitted that there is no such objective teaching in Merriman that leads "to the combination" of Kirkwood and Merriman, and the Examiner has pieced together aspects purportedly found in the prior art to arrive at the invention through hindsight reconstruction. As stated by the Federal Circuit:

> "Combining prior art references without evidence of such a suggestion, teaching, or motivation simply **takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability--the essence of hindsight.**"

In re Dembiczak, 50 USPQ2d 1614, (Fed. Cir. 1999) (*citing Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1138, 227 USPQ 543, 547 (Fed. Cir. 1985); emphasis added).

Therefore, Appellant's claims are believed to be patentable over Kirkwood and Merriman.

Appellant submits that due to certain troublesome vibration modes of the spindle motor, elastic deformation of the mount flange may occur that entails transverse bending of the mount flange between any two of the at least three pads. The damping ring acts as a constrained layer damper by being sandwiched between the baseplate and the motor mount flange.

According to Appellant's invention, as recited in claims 9-11, 13-14 and 47-50 of Group 4, claims 24-36 and 28-29 of Group 8, claim 39 of Group10, and claims 40-44 of Group 13, a damping ring is provided to dissipate distortion energy caused by the vibration of the mount flange. Further, in Appellant's invention, the damping ring further comprises forming a portion perpendicular to the single plane on an outer surface of the at least three surface points of the mounting interface, the portion engaging with the baseplate to dissipate energy resulting from sheer distortion between the baseplate and the at least three surface points. Accordingly, the damping ring surrounds a mount pad (surface point) on three sides. For example, an inner, vertical portion of the damping ring rests against the back of the mount pad. Further, the damping ring actually extends slightly below the plane of the bottom of the mount pad so that the damping ring contacts the baseplate and is slightly compressed when the motor is installed. However, for example, the damping ring does not reside between the mount pad and the baseplate. Thus, the geometric location and stability of the motor and mount flange is not affected by the damping ring, i.e., there is still solid metal-to-metal contact between the motor/mount flange and the baseplate.

In contrast to Appellant's invention, as admitted in the final Office Action dated 4 January 2001, Kirkwood does not disclose a damping ring between the at least three surface points.

Merriman fails to remedy the deficiencies of Kirkwood. Merriman fails to disclose at least a damping ring with a portion disposed perpendicular to the single plane on an outer surface of the at least three surface points of the mounting interface, the portion engaging with the baseplate to dissipate energy resulting from sheer distortion between the baseplate and the at least three surface points.

Rather, Merriman merely discloses a circular step insert, which mounts on an isolation member, the isolation member located between a stepping motor and a frame. At best, Merriman teaches a circular ring that contacts at most two surfaces of an isolation member.

Therefore, claims 9-11, 13-14, 47-50, 24-36, 28-29, 39 and 40-44 are patentable over Kirkwood and Merriman.

According to Appellant's invention, as recited in claims 12, 15, 48 and 51 of Group 5, 27 and 30 of Group 9, and claim 45 of Group 14, the damping ring further comprises a seal disposed on the portion on the outer surface of the at least three surface points of the mounting interface, the seal forming a barrier in a gap between the mount flange and the baseplate.

In contrast to Appellant's invention, as admitted in the final Office Action dated 4 January 2001, Kirkwood does not disclose a seal.

20 Merriman fails to remedy the deficiencies of Kirkwood. Merriman fails to disclose at least a seal forming a barrier in a gap between the mount flange and the baseplate. Moreover, Merriman does not even mention a seal. At best, Merriman discloses a circular step insert that is located between and isolation member and a frame, not a mount flange and a baseplate as recited in Appellant's claims.

Therefore, claims 12, 15, 27, 30, 45, 48 and 51 are patentable over Kirkwood and Merriman.

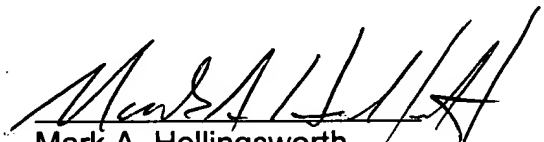
SUMMARY

For the foregoing reasons, it is submitted that the Examiner's rejections of the claims are erroneous. Reversal of these rejections is respectfully requested, and allowance of all of the pending claims is requested.

Respectfully submitted,

Altera Law Group, LLC
6500 City West Parkway, Suite 100
Minneapolis, MN 5534
Phone No. 952-932-0781

Date: 6 August 2001

By: 
Mark A. Hollingsworth
Reg. No. 38,491

MAH/ssh/tjs

APPENDIX 1
THE CLAIMS ON APPEAL

1. A mounting interface for providing a steadfast relationship between a motor and a baseplate, the mounting interface comprising at least three surface points forming a single plane acting as a common boundary between the motor and the baseplate, positions of the at least three surface points being selected to affect a vibrational characteristic of the motor.

2. The mounting interface of claim 1 wherein the at least three surface points further comprise pads.

3. The mounting interface of claim 1 wherein the at least three surface points are coupled to the baseplate.

4. The mounting interface of claim 1 wherein the motor includes a mount flange, wherein the at least three surface points are coupled to the mount flange.

5. The mounting interface of claim 1 wherein the motor includes a mount flange and wherein the at least three surface points provide reduced contact area between the mount flange and the baseplate, the reduced contact area lowering rigidity of the mount flange and lowering resonant frequencies.

6. The mounting interface of claim 1 wherein the at least three surface points have a surface area, the surface area being chosen to reduce acoustical noise.

7. The mounting interface of claim 1 wherein the at least three surface points are formed using a predetermined material, the predetermined material being chosen to reduce acoustical noise.

8. The mounting interface of claim 1 wherein the at least three surface points are positioned at predetermined radial angles therebetween, the predetermined radial angles being chosen to reduce acoustical noise.

9. The mounting interface of claim 1 further comprising a damping ring 22-6 disposed on an inner side and between the at least three surface points for dissipating distortion energy.

10. The mounting interface of claim 9 wherein the motor includes a mount flange 18 and wherein the damping ring is coupled to the mount flange.

11. The mounting interface of claim 10 wherein the damping ring further comprises a portion 22-3 disposed perpendicular to the single plane on an outer surface of the at least three surface points of the mounting interface, the portion engaging with the baseplate to dissipate energy resulting from sheer distortion between the baseplate and the at least three surface points.

12. The mounting interface of claim 11 wherein the damping ring further comprises a seal 22-3 disposed on the portion on the outer surface of the at least three surface points of the mounting interface, the seal forming a barrier in a gap between the mount flange and the baseplate.

13. The mounting interface of claim 9 wherein the damping ring is coupled to the baseplate.

14. The mounting interface of claim 13 wherein the damping ring further comprises a portion disposed perpendicular to the single plane on an outer surface of the at least three surface points of the mounting interface, the portion engaging with the baseplate and the at least three surface points to dissipate energy resulting from sheer distortion between the baseplate and the at least three surface points.

15. The mounting interface of claim 14 wherein the damping ring further comprises a seal disposed on the portion on the outer surface of the at least three surface points of the mounting interface, the seal forming a barrier in a gap between the motor and the baseplate.

16. A data storage system, comprising:

a storage medium;

an actuator including a transducer disposed at a distal end of an actuator arm;

an actuator motor, coupled to the actuator, for moving the transducer relative to the storage medium;

a baseplate;

a spindle motor for rotating the storage medium;

a mount flange, coupled to the spindle motor, for coupling the spindle motor to the baseplate; and

a mounting interface disposed between the mount flange and the baseplate, the mounting interface comprising at least three surface points forming a single plane acting as a common boundary between the mount flange and the baseplate, positions of the at least three surface points being selected to affect a vibrational characteristic of the spindle motor.

17. The data storage system of claim 16 wherein the at least three surface points further comprise pads.

18. The data storage system of claim 16 wherein the at least three surface points are coupled to the baseplate.

19. The data storage system of claim 16 wherein the at least three surface points are coupled to the mount flange.

20. The data storage system of claim 16 wherein the at least three surface points provide reduced contact area between the mount flange and the baseplate, the reduced contact area lowering rigidity of the mount flange and lowering resonant frequencies.

21. The data storage system of claim 16 wherein the at least three surface points have a surface area, the surface area being chosen to reduce acoustical noise.

22. The data storage system of claim 16 wherein the at least three surface points are formed using a predetermined material, the predetermined material being chosen to reduce acoustical noise.

23. The data storage system of claim 16 wherein the at least three surface points are positioned at predetermined radial angles therebetween, the predetermined radial angles being chosen to reduce acoustical noise.

24. The data storage system of claim 16 further comprising a damping ring disposed on an inner side and between the at least three surface points for dissipating distortion energy.

25. The data storage system of claim 24 wherein the damping ring is coupled to the mount flange.

26. The data storage system of claim 25 wherein the damping ring further comprises a portion disposed perpendicular to the single plane on an outer surface of the at least three surface points of the mounting interface, the portion engaging with the baseplate to dissipate energy resulting from sheer distortion between the baseplate and the at least three surface points.

27. The data storage system of claim 26 wherein the damping ring further comprises a seal disposed on the portion on the outer surface of the at least three surface points of the mounting interface, the seal forming a barrier in a gap between the mount flange and the baseplate.

28. The data storage system of claim 24 wherein the damping ring is coupled to the baseplate.

29. The data storage system of claim 28 wherein the damping ring further comprises a portion disposed perpendicular to the single plane on an outer surface of the at least three surface points of the mounting interface, the portion engaging with the baseplate and the at least three surface points to dissipate energy resulting from sheer distortion between the baseplate and the at least three surface points.

30. The data storage system of claim 29 wherein the damping ring further comprises a seal disposed on the portion on the outer surface of the at least three surface points of the mounting interface, the seal forming a barrier in a gap between the motor and the baseplate.

31. A method for reducing acoustic dynamics of a spindle motor, comprising forming a mounting interface between a spindle motor and a baseplate, the mounting interface comprising at least three surface points forming a single plane acting as a common boundary between the spindle motor and the baseplate, positions of the at least three surface points being selected to affect a vibrational characteristic of the motor.

32. The method of claim 31 wherein the forming a mounting interface between a spindle motor and a baseplate further comprises forming the mounting interface on the baseplate.

33. The method of claim 31 wherein the forming a mounting interface between a spindle motor and a baseplate further comprises forming the mounting interface on a mount flange and coupling the mount flange to the spindle motor.

34. The method of claim 31 wherein the forming a mounting interface further comprises forming at least three surface pads.

35. The method of claim 31 wherein the forming a mounting interface further comprises reducing the contact area between a mount flange of the spindle motor and the baseplate, the reduced contact area lowering resonant frequencies.

36. The method of claim 31 wherein the forming a mounting interface further comprises forming at least three surface points having a surface area, the surface area being chosen to reduce acoustical noise.

37. The method of claim 31 wherein the forming a mounting interface further comprises forming at least three surface points using a predetermined material, the predetermined material being chosen to reduce acoustical noise.

38. The method of claim 31 wherein the forming a mounting interface further comprises forming at least three surface points with a predetermined radial angle between each of the at least three surface points, the predetermined radial angles being chosen to reduce acoustical noise.

39. The method of claim 31 further comprising forming a damping ring on an inner side and between the at least three surface points for dissipating distortion energy.

40. The method of claim 39 wherein the forming a mounting interface between a spindle motor and a baseplate further comprises forming the mounting interface on a mount flange and wherein the damping ring is coupled to the mount flange.

41. The method of claim 40 wherein the forming of the damping ring further comprises forming a portion perpendicular to the single plane on an outer surface of the at least three surface points of the mounting interface, the portion engaging with the baseplate to dissipate energy resulting from sheer distortion between the baseplate and the at least three surface points.

42. (amended) The method of claim 41 wherein the forming of the damping ring further comprises forming a seal on the portion at the outer surface of the at least three surface points of the mounting interface, the seal forming a barrier in a gap between the mount flange and the baseplate.

43. The method of claim 39 wherein the damping ring is coupled to the baseplate.

44. The method of claim 43 wherein the forming of the damping ring further comprises forming a portion perpendicular to the single plane on an outer surface of the at least three surface points of the mounting interface, the portion engaging with the baseplate and the at least three surface points to dissipate energy resulting from sheer distortion between the baseplate and the at least three surface points.

45. The method of claim 44 wherein the forming of the damping ring further comprises forming a seal on the portion at the outer surface of the at least three surface points of the mounting interface, the seal forming a barrier in a gap between the motor and the baseplate.

46. A mounting interface for providing a steadfast relationship between a motor and a baseplate, the mounting interface comprising a damping ring disposed on an inner side and between at least three surface points, the damping ring dissipating distortion energy, positions of the at least three surface points being selected so as to affect a vibrational characteristic of the motor.

47. The mounting interface of claim 46 wherein the damping ring further comprises a portion disposed on an outer surface of the at least three surface points of the mounting interface, the portion engaging with the baseplate to dissipate energy resulting from sheer distortion between the baseplate and the at least three surface points.

48. The mounting interface of claim 47 wherein the damping ring further comprises a seal disposed on the portion on the outer surface of the at least three surface points of the mounting interface, the seal forming a barrier in a gap between the mount flange and the baseplate.

49. The mounting interface of claim 46 wherein the damping ring is coupled to the baseplate.

50. The mounting interface of claim 49 wherein the damping ring further comprises a portion disposed on an outer surface of the at least three surface points of the mounting interface, the portion engaging with the baseplate and the at least three surface points to dissipate energy resulting from sheer distortion between the baseplate and the at least three surface points.

51. The mounting interface of claim 50 wherein the damping ring further comprises a seal disposed on the portion on the outer surface of the at least three surface points of the mounting interface, the seal forming a barrier in a gap between the motor and the baseplate.

APPENDIX 2

OFFICE ACTIONS AND AMENDMENTS/RESPONSES

A. Office Action mailed July 6, 2000

B. Amendment mailed October 6, 2000

C. Final Office Action mailed January 4, 2001

D. Amendment mailed March 28, 2001

E. Advisory Action mailed April 4, 2001

F. Interview Summary mailed April 19, 2001